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Three New Species of Hydrachnellae (Acari)  
of Streams in Japan<sup>1)</sup>

*With 5 Text-figures*

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**ABSTRACT** Three new rheophilous water mites, *Sperchon* (*Hispidosperchon*) *yamagatensis* n. sp., *Aturus amatsuensis* n. sp., and *Aturus vietsi* n. sp. from streams in Yamagata and Chiba Prefectures are described and illustrated.

In this study, three new species of rheophilous water mites among the specimens of our collection as listed below are described and illustrated. The holotypes, allotypes and a part of the paratypes designated in this paper will be deposited in the collection of the Laboratory of Biology, Tokiwa University, Mito, and the other paratypes will be deposited in the collection of Shimotsuma-daiichi Prefectural High School, Shimotsuma, Ibaraki Prefecture.

Sperchontidae

*Sperchon* (*Hispidosperchon*) *yamagatensis* n. sp.

Aturidae

*Aturus amatsuensis* n. sp.

*Aturus vietsi* n. sp.

*Sperchon* (*Hispidosperchon*) *yamagatensis* n. sp.

(Fig. 1)

*Male.* Body oval in shape, 0.52 mm in length and 0.47 mm in width. Skin

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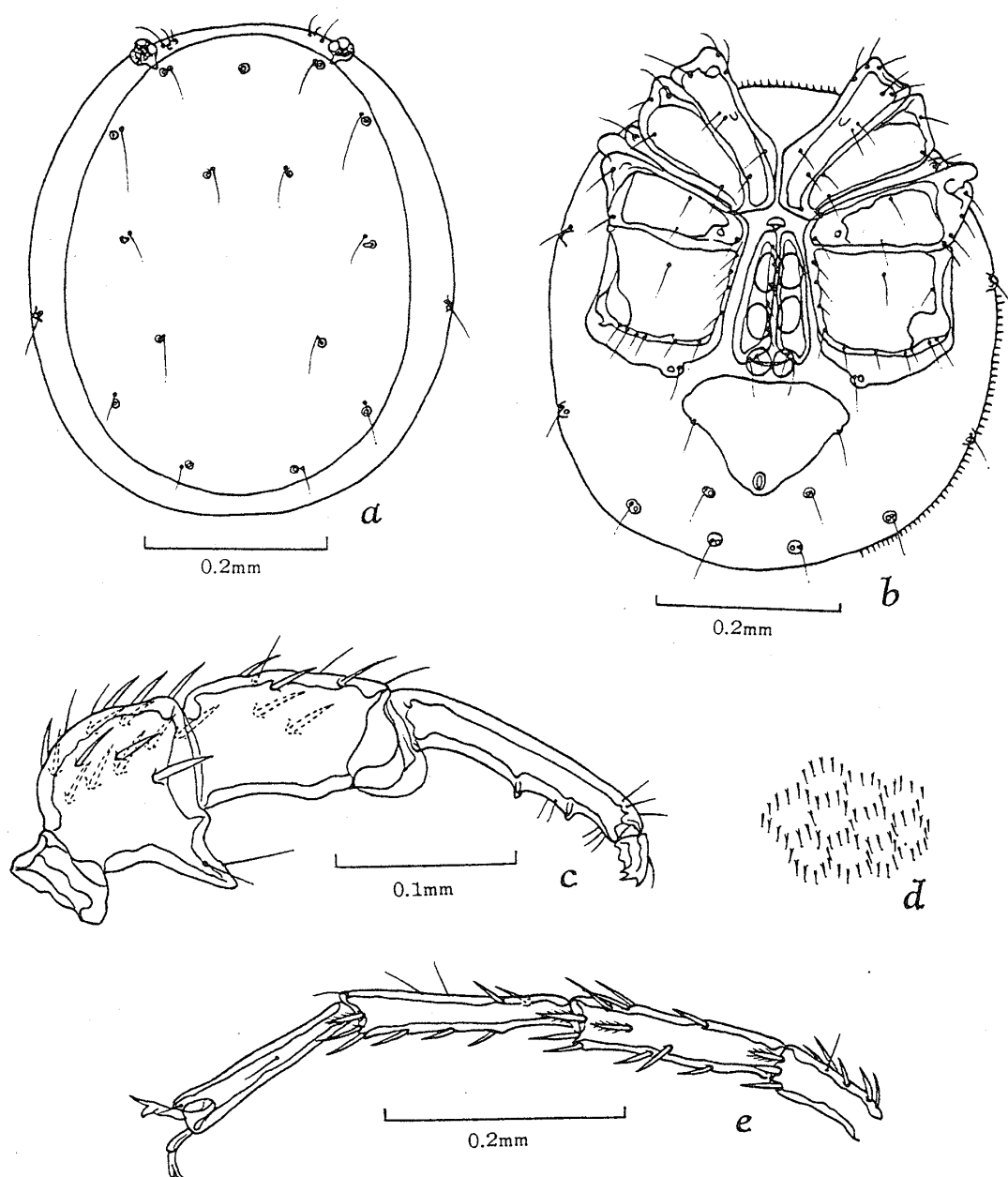


Fig. 1. *Sperchon* (*Hispidosperchon*) *yamagatensis* n. sp., male: a, dorsum; b, venter; c, palp; d, skin texture (posterior part of venter); e, right IV leg, 3-6th segments.

soft, almost colorless and covered with very fine spinules which are arranged in hexagonal pattern as shown in Fig. 1 d. Dorsum almost covered with a large dorsal shield, of ellipse, not so hard,  $500\ \mu\text{m}$  in length and  $414\ \mu\text{m}$  in width, indicating porous appearance. A colorless frontal organ and seven pairs of glandularia present on it as shown in Fig. 1 a. Antenniform bristles small. Eyes distinct and their interval measured  $264\ \mu\text{m}$ .

Capitulum 180  $\mu\text{m}$  in length. Chelicerae 210  $\mu\text{m}$  in length, each including a claw. Palps stout and measured segments as shown in Table 1, in  $\mu\text{m}$ . P-I spineless. P-II very broad and stout, having a long conical process on ventral surface, and many stout spines on dorsal and lateral surfaces. P-III with no tooth-like papillae on ventral surface and with some strong bristles on dorsal and lateral surfaces. P-IV moderately long and with two prominent glandular plugs on ventral surface, located moderately apart from each other as shown in Fig. 1 c.

Table 1.

Palps:	I	II	III	IV	V
Dorsal surface	30	102	116	131	30
Height	54	90	72	30	—

Feature of ventral surface as shown in Fig. 1 b. Four epimeral groups rather large and located close by each other. Ep-III with a glandular pore near each inner portion. Legs having no swimming hair and with a moderate number of stout spines on each leg. Measurements of legs, in  $\mu\text{m}$ : L-I, 560; L-II, 590; L-III, 650; L-IV, 910. Feature of genitalia as shown in the text figure. Gonopore 132  $\mu\text{m}$  in length. Present a large reversed triangular-shaped anal shield, 120  $\mu\text{m}$  in length and 180  $\mu\text{m}$  in width, just behind genital organ. Anus located at the posterior extremity of the shield. Two pair of lateral and three pair of posterior glandularia present on the ventral surface. Chitins of dorsal shield, epimera, legs, genital shield and anal shield light yellowish-brown in color. Body suspected probably reddish brown in living status.

Female unknown.

*Type-specimen.* Holotype, Prep. No. 1836, male.

*Type-locality.* One male was captured on Aug. 1, 1975 by the junior author, T. NAGATSUKA, in a stream (water temp., 17°C, pH, 6.4) of the river Nikko-gawa, Yawata-chô, Akumi-gun, Yamagata Prefecture.

*Remarks.* Though the present new species closely resembles *S. denticulatus* KOENIKE, 1895, *violaceus* WALTER, 1944, *decurellus* HABEEB, 1955, and *mittelli* HABEEB, 1955, it is distinguished from those species by skin color, shape of dorsal shield and a large reversed triangular-shaped anal shield. *Sperchon* (*Hispidosperchon*) *violaceus* WALTER var. reported by IMAMURA (1953) from Hiroshima Prefecture should be corrected to *S. (Hispid.) denticulatus* WALTER.

#### *Aturus amatsuensis* n. sp.

(Figs. 2-3)

*Male* (Fig. 2). Body almost pentagonal in dorsal view, measured 0.37 mm in length, excluding epimera, and 0.29 mm in width. Anterior parts of Ep. I and II protruded far beyond the body margin. Anterior body margin nearly straight, and

the posterior body protruded a little conically as shown in Fig. 2 c. Eyes present but vestigial, having no black pigment. Interval between them  $90\text{ }\mu\text{m}$ . Dorsal shield  $328\text{ }\mu\text{m}$  in length and  $256\text{ }\mu\text{m}$  in width, with four pair of glandularia and four pair of muscle scars. Three pair of latero-glandularia present in dorsal groove.

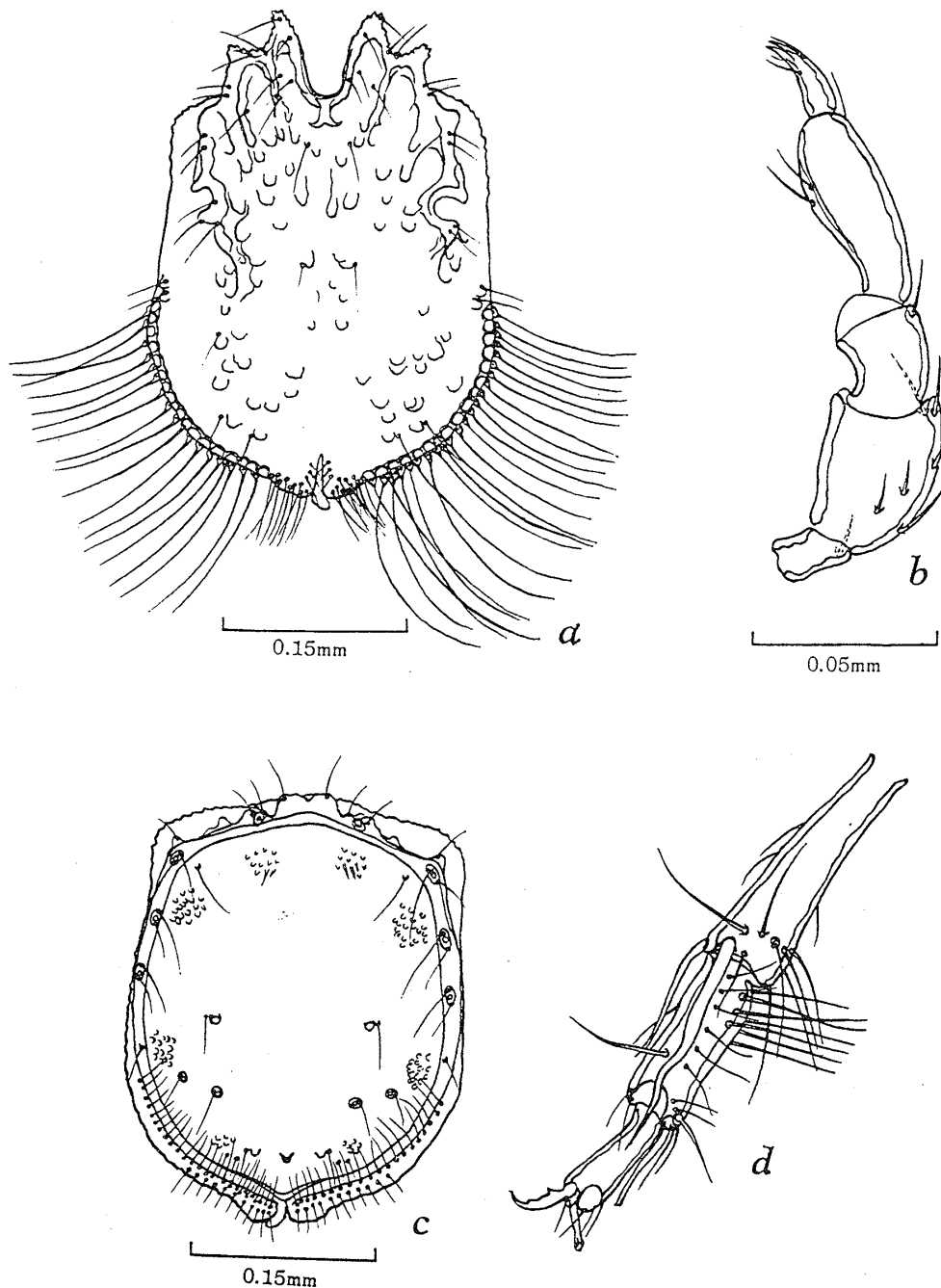


Fig. 2. *Aturus amatsuensis* n. sp., male: a, venter; b, left palp; c, dorsum; d, right IV leg, 4-6th segments.

Two rows of small hairs along the postero-lateral margins of body. Excretory aperture located on dorsal shield near posterior margin. Capitulum  $68\ \mu\text{m}$  in length,  $44\ \mu\text{m}$  in width and  $52\ \mu\text{m}$  in height. Palps as shown in Fig. 2 b, and the segments measured in  $\mu\text{m}$  as in Table 2. A row of long slender hairs on postero-lateral body margins as shown in Fig. 2 a. A tongue-shaped appendage present at the genital cleft. Legs equipped with a moderate number of spines and no swimming hair. L-IV with characteristic spines and hairs as shown in Fig. 2 d. Pedal segments measured in  $\mu\text{m}$  as shown in Table 3. Penis skeleton  $120\ \mu\text{m}$  in length and  $76\ \mu\text{m}$  in width. Excretory aperture on dorsal shield located near the posterior margin. Body light yellowish red in color.

Table 2.

Palps:	I	II	III	IV	V
Dorsal surface	16	52	32	64	28
Height	13	36	26	23	10

Table 3.

Legs	Seg.					
	1	2	3	4	5	6
I	28	36	44	62	68	76
II	32	44	48	68	80	84
III	36	52	56	88	100	96
IV	80	160	92	100	96	72

*Female* (Fig. 3). Body almost oval in dorsal view, anterior margin nearly straight, and measured  $0.38\ \text{mm}$  in length, excluding epimera, and  $0.32\ \text{mm}$  in width. Capitular bay  $80\ \mu\text{m}$  in depth and  $68\ \mu\text{m}$  in width. Eyes vestigial and with no pigment as in the male, and their interval  $88\ \mu\text{m}$ . Dorsal shield  $350\ \mu\text{m}$  in length and  $280\ \mu\text{m}$  in width. Features of dorsum and venter as shown in Figs. 3 a & b.

Shape of palps similar to those of the male. Palpal segments measured in  $\mu\text{m}$  as in Table 4. Genital plates  $116\ \mu\text{m}$  in length and each with 8 acetabulae. Excretory aperture opened at the posterior extremity of dorsal shield. Body color almost the same as that of the male.

Table 4.

Palps:	I	II	III	IV	V
Dorsal surface	20	52	28	64	28
Height	15	36	26	24	12

*Type-series.* Holotype, Prep. No. 1881, male. Allotype, Prep. No. 1882, female.

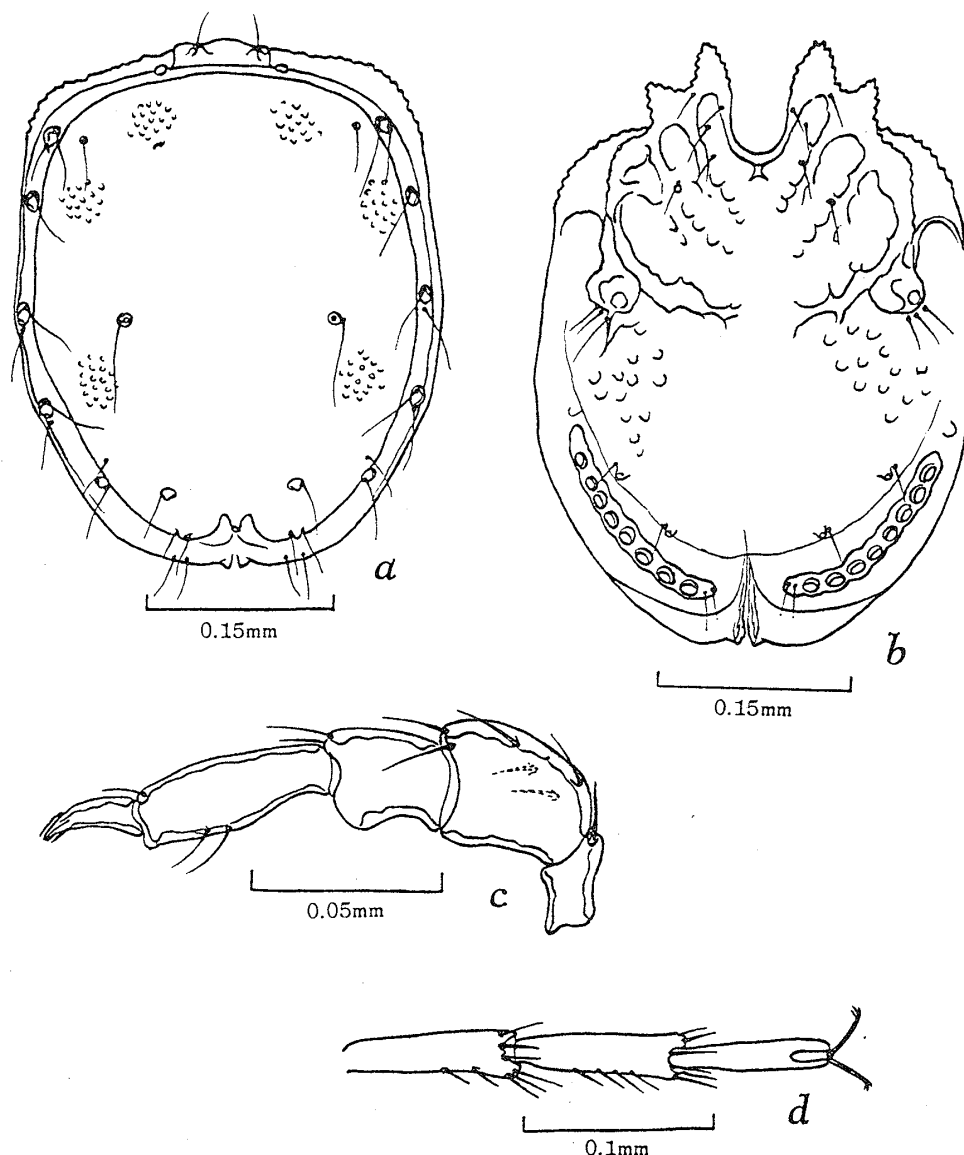


Fig. 3. *Aturus amatsuensis* n. sp., female: a, dorsum; b, venter; c, right palp; d, left IV leg, 4-6th segments.

*Type-locality.* Twelve males and eleven females were collected on June 13, 1975 by the junior author, T. NAGATSUKA, in a stream of the Futama-gawa (water temp. 15.5°C, pH. 7.5) at Amatsu-Kominato-chô, Awa-gun, Chiba Prefecture.

*Remarks.* Though the present new species resembles *Aturus canadensis* HABEED, 1935, and *californiensis* HABEED, 1959, both from North America, it is distinguished from those species by the feature of spines on IV legs and the long hairs on postero-lateral margins of body in the male. This new species seems to become differentiated as psammons in view of the degenerated eyes and body color.

*Aturus vietsi* n. sp.<sup>2)</sup>

(Figs. 4-5)

*Male* (Fig. 4). Body almost hexagonal in dorsal view, 0.35 mm in length, excluding epimera, and 0.25 mm in width. Central posterior part of body a little

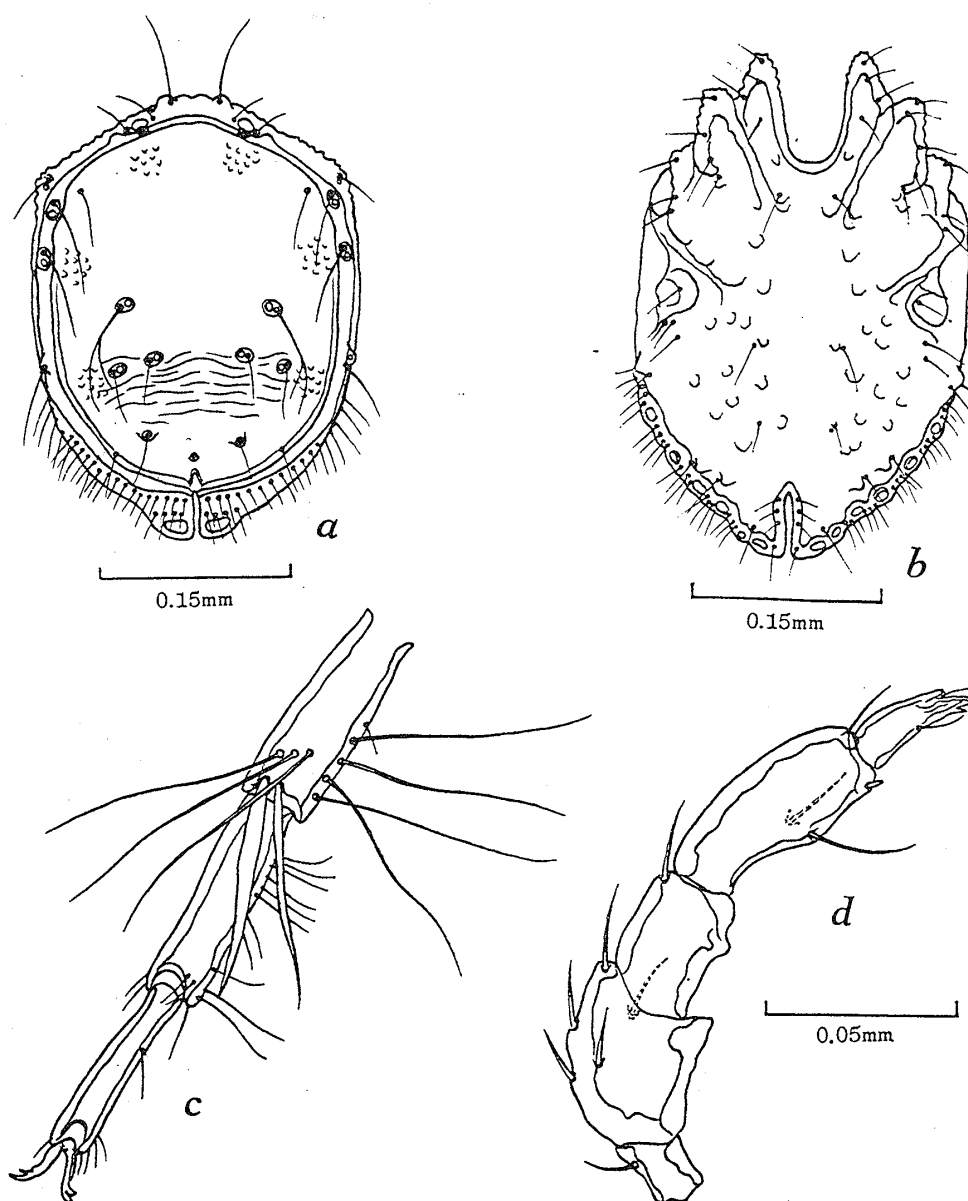


Fig. 4. *Aturus vietsi* n. sp., male: a, dorsum; b, venter; c, right IV leg, 4-6th segments; d, right palp.

2) This new species is named in honour of Dr. Kurt O. VIETS for his 73th birthday on May 11, 1983.

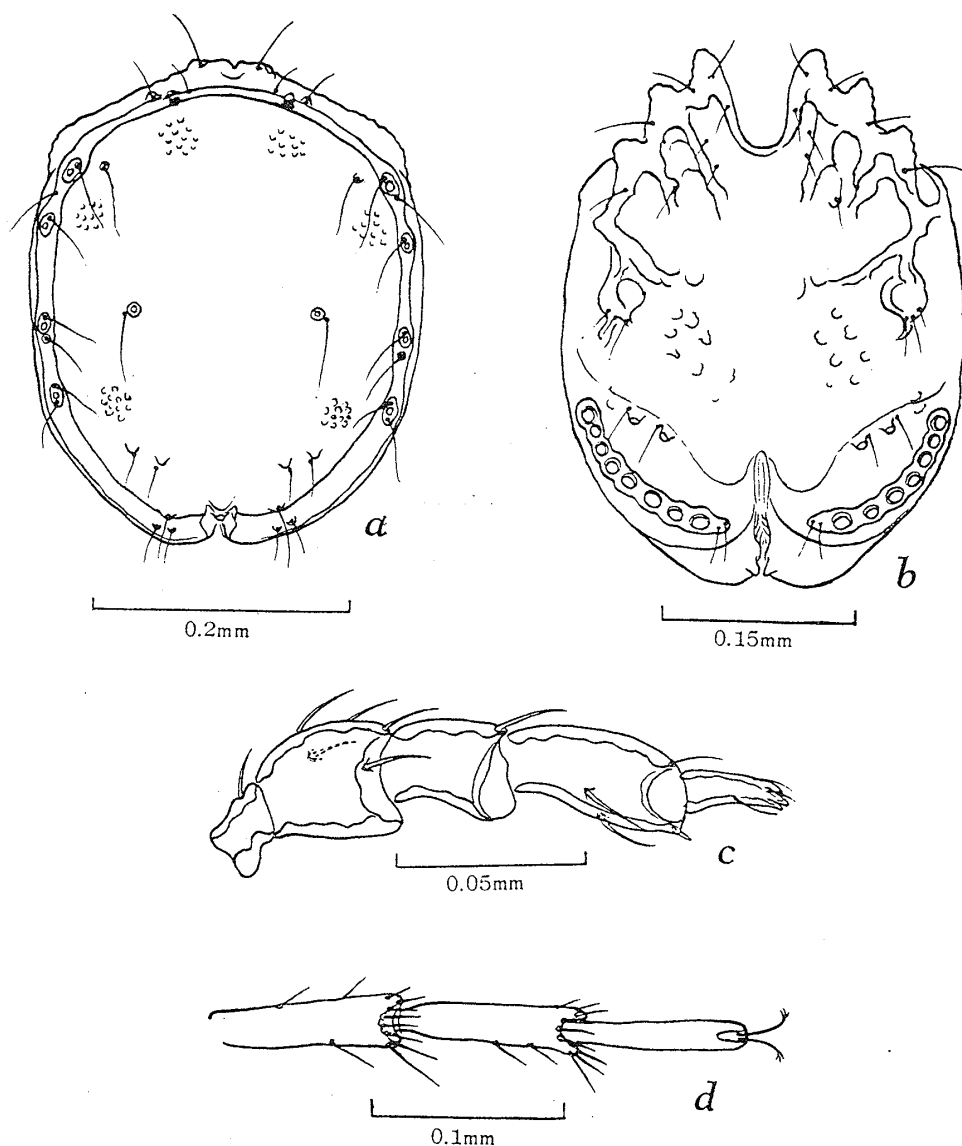


Fig. 5. *Aturus vietsi* n. sp., female; a, dorsum; b, venter; c, left palp; d, left IV leg, 4-6th segments.

projected conically. Eyes rudimentary, but each with a small black pigment grain. Interval between them  $92\ \mu\text{m}$ . Feature of dorsum as shown in Fig. 4 a. Three pair of glandularia in dorsal groove. Dorsal shield  $280\ \mu\text{m}$  in length,  $230\ \mu\text{m}$  in width, with four pair of glandularia, a pair of which each bears a long bifurcated hair, and three pair of muscle scars. Posterior part of dorsal shield a little declivous, indicating laterally waved stripes. Excretory aperture located on dorsal shield near the posterior end. Small hairs arranged in a row on postero-lateral margins of body.

Capitular bay  $84\ \mu\text{m}$  in depth. Capitulum  $70\ \mu\text{m}$  in length and  $58\ \mu\text{m}$  in width. Palps moderately thick. Ventral surface of P-III not so roundly concave as that of



the preceding species. Palpal segments measured in  $\mu\text{m}$  as shown in Table 5. Chelicerae 92  $\mu\text{m}$  in length, each including a claw.

Table 5.

Palps:	I	II	III	IV	V
Dorsal surface	20	48	28	56	28
Height	16	34	24	24	12

Ventral surface as shown in Fig. 4 b. Genital plates long, but acetabulae on them rather few in number, six on each plate. Pedal segments measured in  $\mu\text{m}$ : L-I, 304; L-II, 320; L-III, 376; L-IV, 576. Feature of IV-L-4 & 5 as shown in Fig. 4 c. Body light yellowish red in color.

*Female* (Fig. 5). Body nearly oval, 0.37 mm in length, excluding epimera, and 0.3 mm in width. Eyes small, and their interval 100  $\mu\text{m}$ . Dorsal shield oval in contour, with three pair of glandularia and three pair of muscle scars as shown in Fig. 5 a. Dorsal shield measured 330  $\mu\text{m}$  in length and 280  $\mu\text{m}$  in width. Four pair of glandularia in dorsal groove. Organs of mouth parts all same as those of the male. Capitulum 68  $\mu\text{m}$  in length and 56  $\mu\text{m}$  in width. Chelicerae 86  $\mu\text{m}$  long, each including a claw. Palps measured in  $\mu\text{m}$  as in Table 6. Genital plates with eight acetabulae on the right plate and seven on the left one. Body color the same as that of the male.

Table 6.

Palps:	I	II	III	IV	V
Dorsal surface	18	48	30	56	28
Height	16	33	24	24	12

*Type-locality.* Two males and two females were collected on June 8, 1975 in a small stream, Ôbizo-gawa (water temp. 20.8°C, pH 7.4) at Amatsu-Kominato-chô, Awa-gun, Chiba Prefecture, by the junior author, T. NAGATSUKA, and one female was captured on July 7, 1981 in the same stream (water temp. 26°C), by the senior author, T. IMAMURA.

*Type-series.* Holotype, Prep. No. 1838, male. Allotype, Prep. No. 1874, female.

*Remarks.* The new species resembles *Aturus estellae* HABEED, 1953, *mugyonensis* HABEED, 1962, and *terraconfusensis* HABEED, 1965, all of North America, but its male is easily distinguished from them by the feature of spines and hairs on the 4th and 5th segments of IV legs.

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